REMARKS

Claims 1-59 are pending in the present application. In the above amendments, claims 2, 10 and 40 have been amended to correct minor typographical errors and new claims 43-59 have been added.

Applicant respectfully responds to this Office Action.

Double Patenting Rejection

The Office Action provisionally rejected claims 1-42 of the present application on the ground of non-statutory obviousness-type double patenting as to co-pending Application No. 10/873,656.

Since co-pending Application No. 10/873,656 has not issued, Applicant would prefer to defer consideration of filing a terminal disclaimer until such time that the rejection becomes actual and final disposition of all claims is required.

The Office Action provisionally rejected claims 1-42 of the present application on the ground of non-statutory obviousness-type double patenting as to co-pending Application No. 10/077,365, now U.S. Patent No. 7,251,730.

"Double patenting depends entirely on what is *claimed* in [an] issued patent. Obviousness relates to what is disclosed (whether or not a patent) in a prior art reference (whether or not a patent). A prior art reference that renders claimed subject matter obvious under 35 USC § 103 does not necessarily create an obviousness-type double patenting situation." (*In re Bartfeld*, 17 USPQ2d 1885 (Fed. Cir. 1991)).

Applicant submits that issued claims 1-38 in U.S. Patent No. 7,251,730 (cited Application No. 10/077,365) do not render the present claims obvious. In particular, the present

claims recite converting BPSK symbols into multiple tones using a lookup table. Such limitation is not recited or made obvious by the claims of U.S. Patent No. 7,251,730. Consequently, Applicant respectfully submits that the claims of U.S. Patent No. 7,251,730 fail to render the present recited claims obvious.

Claim Rejections – 35 USC § 103

The Office Action rejected claims 1-42 as unpatentable under 35 USC 103(a) over Owens (U.S. Patent No. 5,481,611; hereinafter "Owens") in view of Kaiser et al (U.S. Patent No. 6,188,717; hereinafter "Kaiser").

The Office has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787 (Fed. Cir. 1984). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art references must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Third, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

Claims 1, 9, 10, 18, 25, 26, 28

Claims 1, 9, 10, 18, 25, 26 and 28 – *BPSK symbols converted into multiple tones using LUT*

As to independent claims 1, 9, 10, 18, 25, 26 and 28 Office Action cited Owens as teaching the claimed invention except for "*a binary shift keying (BPSK) module configured to generate multiple parallel BPSK symbols*" and "*a second processor coupled to the BPSK module and the storage medium, configured to convert the BPSK symbols into the multiple tones using the LUT*". The Office Action alleges that Kaiser discloses a BPSK module to generate multiple parallel BPSK symbols.

Applicant traverses this rejection in its entirety.

Claimed Elements are Not Taught by the Prior Art

The Office has the burden to show that the prior art included each claimed element. Applicant submits that Owens and Kaiser, either alone or in combination, fail to teach the claimed subject matter of an apparatus and method for authenticating a user having "*a storage medium configured to store ... a look up table (LUT)*", "*a binary shift keying (BPSK) module configured to generate multiple parallel BPSK symbols*" and "*a second processor coupled to the BPSK module and the storage medium, configured to convert the BPSK symbols into the multiple tones using the LUT*".

The Office Action relies on Owens as teaching "a storage medium configured to store a cryptographic key and a look up table (LUT) (See Owens Summary and Column 9 lines 1-9)". However, the cited section in Owens fails to disclose the claimed storage medium having a look up table. At most, Owens teaches the conversion of a user-encrypted digital code into a

corresponding Dual-Tone-Multi-Frequency (DTMF) tone sequence. Owens does not disclose how those tones are obtained.

Additionally, the Office Action admits that Owens does not teach a converter comprising a binary phase shift keying (BPSK) module configured to generate multiple parallel BPSK symbols and a processor configured to convert the BPSK symbols into multiple tones using a look up table. The Office Action relies on Kaiser (Kaiser Summary and Column 5 lines 30-57) as teaching the use of a BPSK module to generate multiple parallel symbols to authenticate users.

However, Kaiser merely teaches a method for reducing interference in the simultaneous radio transmission of digital data between a plurality of subscriber stations and a base station to ensure virtually error-free transmission of different data streams (audio, video, text, data, etc.) on the available radio channel. (See Column 3, lines 30-44). Kaiser fails to teach a method and/or apparatus to authenticate a user that includes converting an access code (BPSK symbols) into multiple tones using a BPSK module that is configured to generate multiple parallel BPSK symbols. Although Kaiser mentions using BPSK to map scrambled code bits into complex data symbols in a data-symbol mapper (See Column 5, lines 22-41), this is merely done to efficiently modulate a signal into a carrier wave while avoiding interference with other signals. The BPSK in Kaiser is used for error protection against channel disturbances (See Column 5, lines 22-25). Kaiser fails to teach, disclose or suggest the claimed apparatus or method for use in authentication by converting an access code into multiple parallel BPSK symbols that are then converted into multiple tones using a look up table. Consequently, the cited prior art fails to teach the limitations as claimed.

<u>No Motivation to Combine Cited References</u>

Assuming, *arguendo*, that every claimed element is taught by the prior art, Applicant further submits that there is no motivation to combine Owens and Kaiser as alleged in the Office Action.

The Office has the burden to show that one of ordinary skill in the art could have combined the elements claimed by known methods, and that in combination, each element would have merely performed the same function as it did separately. "In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

The Office Action notes that the motivation for combining the teachings of Owens with Kaiser "comes from the need for preventing unauthorized access by using BPSK to generate multiple parallel BPSK symbols and to further convert the parallel BPSK symbols into the multiple tones." This alleged motivation ignores the fact that BPSK is not commonly used for securing information against unauthorized access. Instead, BPSK is used for efficiently modulating a signal into a carrier wave while avoiding interference with other signals by providing error protection against channel disturbances.

Moreover, the Kaiser patent refers to simultaneous transmissions of digital data between subscriber stations and a base station, it has nothing to do with user authentication using multiple tones. Applicant submits that, barring hindsight, there is no motivation to combine the unrelated teachings of Kaiser with those of Owens. The use of BPSK as part of a user authentication method is novel over the cited prior art. Additionally, there is no motivation disclosed in the prior art for selecting BPSK over the many other types of modulation schemes commonly in use.

No Reasonable Expectation of Success

Owens describes a cryptography-based entity authentication device that encrypts a random digital sequence using DTMF tones and sends it to a host facility for authentication. Kaiser describes a communication system that uses simultaneous transmissions of digital data between subscriber stations and a base station. The conversion of an access code into BPSK symbols and subsequent conversion of the BPSK symbols into tones is not a simple combination of the cited prior art references. In fact, the claimed invention is significantly more complex than the mere use of DTMF tones described by Owens. In fact, due to the conversion of BPSK to tones, there is no guarantee that such multiple tones can, in practice, sufficiently withstand noise and interference to convey the originally encoded access code. Consequently, Applicant submits that, based on the cited prior art, there is no reasonable expectation of success in making the claimed combination.

Based on at least the foregoing reasons, Applicant respectfully submits that independent claims 1, 9, 10, 18, 25, 26 and 28 are patentably distinguishable over the cited prior art. Therefore, Applicant respectfully requests allowance of independent claims 1, 9, 10, 18, 25, 26 and 28.

Claims 29, 34, and 41

Claims 29, 34 and 41 - *FFT module to generate multiple parallel BPSK symbols and a BPSK module configured to convert the BPSK symbols into an encoded interleaved bit stream of the access code*

As to independent claims 29, 34 and 41 the Office Action cited Owens as teaching the claimed invention except for "*a down-converter configured to demodulate the multiple tones into IFFT symbols*", "*a fast fourier transform (FFT) module configured to generate multiple parallel BPSK symbols*", "*a BPSK module coupled to the processor, configured to convert the BPSK symbols into an encoded interleaved bit stream of the access code*", "*a de-interleaver coupled to the BPSK module, configured to de-interleave the encoded interleaved bit stream*", and "*a decoding module coupled to the de-interleaver, configured to recover the access code from the encoded de-interleaved bit stream.*"

Applicant traverses this rejection in its entirety.

Claimed Elements are Not Taught by the Prior Art

Applicant submits that Owens and Kaiser, either alone or in combination, fail to teach the claimed subject matter.

Owens and Kaiser fail to teach an apparatus and method having "*a down-converter configured to demodulate the multiple tones into IFFT symbols*" and "*a fast fourier transform (FFT) module configured to generate multiple parallel BPSK symbols*" as claimed. The Office Action admits that Owens fails to teach these limitations and relies on Kaiser as teaching both of these limitations. As previously discussed, Kaiser merely teaches a method for reducing interference in simultaneous radio transmissions of digital data between a plurality of subscriber stations and a base station to ensure virtually error-free transmission of different data streams

(audio, video, text, data, etc.) on the available radio channel. (See Column 3, lines 30-44). Kaiser does not teach, disclose or suggest the use of a down-converter configured to demodulate multiple tones into IFFT symbols or a FFT module to generate multiple parallel BPSK symbols. Likewise, Owens merely encrypts a random digital sequence using DTMF tones but does not mention the using BPSK as claimed. Consequently, the cited prior art fails to teach these limitations as claimed.

No Motivation to Combine Cited References

Assuming, *arguendo*, that every claimed element is taught by the prior art, Applicant further submits that there is no motivation to combine Owens and Kaiser as alleged in the Office Action.

The Office Action notes that the motivation for combining the teachings of Owens with Kaiser "comes from the need for preventing unauthorized access by using BPSK to generate multiple parallel BPSK symbols and to further convert the parallel BPSK symbols into the multiple tones." This alleged motivation ignores the fact that BPSK is not commonly used for securing information against unauthorized access. Instead, BPSK is used for efficiently modulating a signal into a carrier wave while avoiding interference with other signals by providing error protection against channel disturbances.

Moreover, the Kaiser patent refers to simultaneous transmissions of digital data between subscriber stations and a base station, it has nothing to do with user authentication using multiple tones. Applicant submits that, barring hindsight, there is no motivation to combine the unrelated teachings of Kaiser with those of Owens. The use of BPSK as part of a user authentication

method is novel over the cited prior art. Additionally, there is no motivation disclosed in the prior art for selecting BPSK over the many other types of modulation schemes commonly in use.

No Reasonable Expectation of Success

Owens describes a cryptography-based entity authentication device that encrypts a random digital sequence using DTMF tones and sends it to a host facility for authentication. Kaiser describes a communication system that uses simultaneous transmissions of digital data between subscriber stations and a base station. The conversion of an access code into BPSK symbols and subsequent conversion of the BPSK symbols into tones is not a simple combination of the cited prior art references. In fact, the claimed invention is significantly more complex than the mere use of DTMF tones described by Owens. In fact, due to the conversion of BPSK to tones, there is no guarantee that such multiple tones can, in practice, sufficiently withstand noise and interference to convey the originally encoded access code. Consequently, Applicant submits that, based on the cited prior art, there is no reasonable expectation of success in making the claimed combination.

Based on at least the foregoing reasons, Applicant respectfully submits that independent claims 29, 34 and 41 are patentably distinguishable over the cited prior art. Therefore, Applicant respectfully requests allowance of independent claims 29, 34 and 41.

Claims 2, 11-13, 19-20 and 27

As to dependent claims 2, 11-13, 19-20 and 27, the Office Action cites Owens and Kaiser as teaching "wherein one of the first or second processor is further configured to repeat the BPSK symbols a selected number of times; and wherein the second processor converts repeated BPSK symbols into the multiple tones (Owens Column 3 lines 61-67)". As discussed with regards to claims 1, 9, 10, 18, 25, 26 and 28, neither Owens nor Kaiser, either alone or in combination, teach, disclose or suggest the use of BSPK in an apparatus or method for use in authentication. Specifically, the conversion of an access code into BPSK symbols and the subsequent conversion of those BPSK symbols into multiple tones for user authentication is not taught by either Owens or Kaiser. The cited sections of Owens and Kaiser fail to teach that *repeated* BPSK symbols are converted into multiple tones as claimed. Consequently, Owens and Kaiser fail to teach the limitations of claims 2, 11-13, 19-20 and 27. Additionally, as noted above, there is no motivation to combine the cited references. Applicant submits that these claims are also in condition for allowance due to their dependence on independent claims 1, 10, 18 and 26, respectively.

Claims 33 and 35-37

Claimed Elements are Not Taught by the Prior Art

As to dependent claims 33 and 35-37, the Office Action cites Owen and Kaiser as teaching "wherein the FFT module converts the multiple tones into repeated sets of BPSK symbols and generates a selected set of BPSK symbols; and wherein the BPSK module converts the selected set of BPSK symbols (Kaiser Summary, Column 5 lines 30-57 and Column 7 lines 4-38)". As discussed above, neither Owens nor Kaiser, either alone or in combination, teach, disclose or suggest the use of a FFT module and a BSPK module in an apparatus or method for

use in authentication. Consequently, Owens and Kaiser fail to teach the limitations of claims 33 and 35-37. Applicant also submits that these claims are in condition for allowance due to their dependence on independent claim 29.

No Motivation to Combine Cited References

Assuming, *arguendo*, that every claimed element is taught by the prior art, Applicant further submits that there is no motivation to combine Owens and Kaiser as alleged in the Office Action.

The Office has the burden to show that one of ordinary skill in the art could have combined the elements claimed by known methods, and that in combination, each element would have merely performed the same function as it did separately. "In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

No independent reason has been provided whereby the teachings of Owens would be combined with those of Kaiser to provide an apparatus and method for use in authentication as claimed. Owens is directed toward authenticating a user while Kaiser is directed to a method to reduce interference in simultaneous radio transmissions of digital data between a plurality of subscriber stations and a base station. As Kaiser does not teach, disclose or suggest an apparatus or method for use in authentication as in the claimed invention, there is no objective reason why a person of ordinary skill in the art would choose to combine the references. Merely citing a reference that discloses a claimed element missing from the main reference does not provide a motivation to combine the references. There is no objective reason found in Kaiser to suggest

that it can be used in an apparatus or method for use in authentication as in the claimed invention.

Claims 3-8, 14-17, 21-24, 30-32, 38, 39, 40 and 42

As to dependent claims 3-8, 14-17, 21-24, 30-32, 38, 39, 40 and 42 the Office Action also cites Owens and Kaiser as teaching the recited limitations. While Applicant disagrees the cited prior art teaches the limitations recited in these claims, this argument need not be reached since these dependent claims are in condition for allowance due to their dependence on independent claims 1, 9, 10, 17, 18, 23, 25, 26, 28, 29, 34 and/or 41.

Additionally, Applicant has added new independent claims 43, 51 and 53 having substantially the same scope of independent claims 10, 26 and 34, respectively. Applicant believes the application is in condition for allowance. Reconsideration and an early allowance are respectfully requested.

Applicant has reviewed the references made of record and assert that the pending claims are patentable over the references made of record.

In view of the above, therefore, Applicant respectfully requests reconsideration and withdrawal of the rejection of, and/or objection and allowance of claims 1-42.

Should any of the above rejections be maintained, Applicant respectfully requests that the noted limitations be identified in the cited references with sufficient specificity to allow Applicant to evaluate the merits of such rejections. In particular, rather than generally citing whole sections or columns, Applicant requests that the each claimed element be specifically identified in the prior art to permit evaluating the references.

CONCLUSION

In light of the amendments contained herein, Applicant submits that the application is in condition for allowance, for which early action is requested.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026. Applicant hereby petitions a one 1 month Extension of Time by charged to Deposit Account No. 17-0026.

Respectfully submitted,

Date: September 10, 2007   By: /Won Tae C. Kim/
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